

APPEAL BRIEF  
Examining Group 1797  
Patent Application  
Docket No. P.P.101  
Serial No. 10/541,145

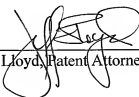
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner : Shogo Sasaki  
Art Unit : 1797  
Appellants : Tobias Schmidt, Uwe Lehmann (as amended)  
Serial No. : 10/541,145  
Filed : January 3, 2006  
Conf. No. : 4933  
For : Miniaturized Gas Chromatograph and Injector for the Same

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APPEAL BRIEF  
UNDER 37 CFR §41.37

I hereby certify that this correspondence is being electronically transmitted via EFS to the United States Patent and Trademark Office on January 18, 2011.

  
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Jeff Lloyd, Patent Attorney, Reg. No. 35,589

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# I. REAL PARTY IN INTEREST

This application is owned by Tobias Schmidt and Uwe Lehmann. Appellants note that Mathias Mahnke was deleted as an inventor by Amendment Under 37 C.F.R. §1.48(b)(1) filed June 22, 2006. No assignments have been recorded in this application.

# II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

# III. STATUS OF THE CLAIMS

Claims 1, 2, 4-6, 9, and 11-13 are pending in the application. Claims 7, 8, 10, 18, 19, 21-23, 27, and 28 were canceled in the Amendment of August 11, 2010. Claims 3, 17, and 20 were canceled in the Amendment of August 18, 2009. Claims 14-16 and 24-26 were canceled in the Preliminary Amendment of June 22, 2006. The final rejection of claims 1, 2, 4-6, 9, and 11-13 is appealed herein.

# IV. STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. §1.116 was filed on August 11, 2010 subsequent to the final Office Action mailed June 18, 2010. The Amendment filed August 11, 2010 was entered by the Examiner, as indicated in the Advisory Action of August 26, 2010. A second Amendment Under 37 C.F.R. §1.116 was filed on November 18, 2010 subsequent to the final Office Action of June 18, 2010. The Amendment filed November 18, 2010 was also entered by the Examiner, as indicated in the Advisory Action of December 3, 2010. Claims 1, 2, 4-6, 9, and 11-13 are currently pending and are listed in the Appendix attached hereto.

# V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The independent claim involved in this appeal is claim 1.

Claim 1 is drawn to a miniaturized gas chromatograph, comprising at least one injector, one separation column, and a detector (page 3, lines 6-7). The injector, the separation column, and the detector are combined on a circuit board to give a gas chromatography module (page 3, lines 7-8). The injector comprises a first sheet with channels and a second sheet with channels,

wherein the sheets may be displaced relative to each other, whereby at least one of the sheets is provided with a layer of plastic on the side of the sheet facing the other sheet (page 3, lines 8-11). The layer of plastic is a plasma polymerized layer (page 10, lines 11-17). The miniaturized gas chromatograph further comprises at least one heating element configured such that one or more of the injector, the separation column, and/or the detector can be temperature-controlled (page 7, lines 16-19). The miniaturized gas chromatograph further comprises an electronic control and evaluation unit placed on the circuit board and a plurality of recesses provided in the circuit board such that the electronic control and evaluation unit is protected from the heat emitted by the heating elements (page 7, lines 4-5; and page 7, line 21 through page 8, line 7).

#### VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 2, 4, 6, 9, and 11-13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Jones (U.S. Patent No. 3,916,465) or Jones (U.S. Patent No. 3,800,602) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492).

Claim 5 has been rejected under 35 U.S.C. §103 (a) as being obvious over Jones (U.S. Patent No. 3,916,465) or Jones (U.S. Patent No. 3,800,602) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492), and further in view of Lehmann *et al.* (IDS: Micro Total Analysis system, 2000, 167-170).

## VII. ARGUMENT

**A. Claims 1, 2, 4, 6, 9, and 11-13 are patentable because the Examiner has not established a *prima facie* case of obviousness.**

Claims 1, 2, 4, 6, 9, and 11-13 have been rejected under 35 U.S.C. §103(a) as being obvious over Jones (U.S. Patent No. 3,916,465; hereinafter referred to as “Jones ‘465”) or Jones (U.S. Patent No. 3,800,602; hereinafter referred to as “Jones ‘602”) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492; hereinafter referred to as “Lehmann 2001”). Appealed claims 1, 2, 4, 6, 9, and 11-13 do not stand or fall together for purposes of the Appeal of this rejection under 35 U.S.C. §103(a).

Claims 1, 2, 6, 9, and 11-13

Claim 1 is directed to a novel and advantageous miniaturized gas chromatograph, comprising at least one injector, one separation column, and a detector. The injector, the separation column, and the detector are combined on a circuit board to give a gas chromatography module. The injector comprises a first sheet with channels and a second sheet with channels, wherein the sheets may be displaced relative to each other, whereby at least one of the sheets is provided with a layer of plastic on the side of the sheet facing the other sheet. The layer of plastic is a plasma polymerized layer. The miniaturized gas chromatograph further comprises at least one heating element configured such that one or more of the injector, the separation column, and/or the detector can be temperature-controlled, as well as an electronic control and evaluation unit placed on the circuit board and a plurality of recesses provided in the circuit board such that the electronic control and evaluation unit is protected from the heat emitted by the heating elements.

Jones ‘465 and Jones ‘602 (collectively “the Jones references”) are directed to conventional gas chromatographs while the claimed invention is directed to a miniaturized gas chromatograph. Conventional gas chromatographs and miniaturized gas chromatographs have several specific, well-recognized differences between them. The Declaration Under 37 C.F.R.

§1.132 of Uwe Lehmann is provided in the Evidence Appendix and was submitted with the Amendment filed May 4, 2010. As discussed in paragraphs 4-6 the Declaration of Uwe Lehmann, who is aware of the level of ordinary skill in the art (see, e.g. paragraphs 2-3 of the Declaration), the ordinary skilled artisan cannot simply transfer any functional or manufacturing characteristics from one type of gas chromatograph to the other. The Jones references are directed to completely different classes of devices, using completely different materials, and completely different manufacturing techniques than those of the claimed invention.

One skilled in the art of conventional gas chromatographs, as in the Jones references, is not the same as the ordinary skilled artisan in the field of miniaturized gas chromatographs, as in the claimed invention. The Examiner asserts that “[a] change in size is generally recognized as being within the level of ordinary skill in the art,” “a person of ordinary skill has good reason to pursue the known options within his or her technical grasp,” and “a skilled artisan... interested in making a small chromatogram (sic)... would be motivated to alter the dimension of the known injector to accommodate the injector of his/her invention (Advisory Action of December 3, 2010, pages 2-3). However, it is not obvious to one having ordinary skill in the art to merely reduce the size of the Jones devices. It cannot be disputed that one of ordinary skill in the art of gas chromatographs does not have the technical grasp to produce the miniaturized gas chromatographs of the claimed invention. A change in size may well be within the level of ordinary skill in the art if it is only a mere downsizing of elements using the same materials and manufacturing techniques taught in a cited reference, but that is not the case here. The miniaturized gas chromatograph of the claimed invention has elements that are so miniaturized, neither the materials nor the manufacturing techniques used for conventional gas chromatographs could possibly be used.

Miniaturized gas chromatographs are not merely conventional devices of conventional materials, provided in shrunken form; rather, they are of vastly different materials and manufactured in vastly different ways. Conventional gas chromatographs are manufactured using conventional techniques such as casting, bending, welding, soldering, milling, and the like; while miniaturized gas chromatographs use manufacturing techniques known from integrated circuit production (e.g. micro-machined or micro-mechanical system techniques such as wet etching, dry etching, electro-discharge machining, and photolithographic techniques). As

discussed in paragraph 6 of the Declaration of Uwe Lehmann, these manufacturing techniques are significantly different than the techniques used for conventional gas chromatographs.

In fact, the Jones references are so different as to constitute non-analogous art which the ordinary artisan would find neither useful nor suggestive when contemplating the subject invention. Two criteria are relevant in determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the art is not within the same field of endeavor, whether it is still reasonably pertinent to the particular problem to be solved. *In re Clay*, 966 F.2d 656, 658-59, 23 USPQ2d 1058, 1060 (Fed.Cir.1992); *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 864 (Fed.Cir.1993). In this instance, the conventional gas chromatographs of the Jones references are not in the same field of endeavor as the claimed miniaturized gas chromatograph and would not be considered by a skilled artisan to be pertinent to any problem to be solved in the field of miniaturized gas chromatography. If a hypothetical invention included a micro-sized cylinder etched into a circuit board, it would not be reasonable to consider as analogous art a reference pertaining to macro-sized concrete columns, simply because both teach a cylindrical column. The situation here is parallel. Referring again to the Declaration of Uwe Lehmann, neither the materials nor the manufacturing techniques used for conventional gas chromatographs could possibly be used for a miniaturized gas chromatograph (paragraph 6).

The Examiner states that the claims “do not structurally limit the claimed apparatus to a particular dimension/size” and seems to implicitly require that the claims recite a maximum size in order to distinguish from the conventional gas chromatograph of the Jones references (Advisory Action of December 3, 2010, page 3). However, though the claims do not explicitly recite a particular dimension or size, this is nevertheless defined by the term “miniaturized.” As discussed in paragraph 5 of the Declaration of Uwe Lehmann, the term “miniaturized gas chromatograph” has a known meaning in the art and excludes conventional structures and techniques. “If the claim preamble is ‘necessary to give life, meaning, and vitality’ to the claim, then the claim preamble should be construed as if in the balance of the claim.” *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999); *Jansen v. Rexall Sundown, Inc.*, 342 F.3d 1329, 1333, 68 USPQ2d 1154, 1158 (Fed. Cir. 2003). Also, the determination of whether preamble recitations are structural limitations or mere



statements of purpose or use "can be resolved only on review of the entirety of the [record] to gain an understanding of what the inventors actually invented and intended to encompass by the claim." *Corning Glass Works*, 868 F.2d at 1257, 9 USPQ2d at 1966; MPEP §2111.02. In this case, as established by the Lehmann Declaration and the subject specification, the term "miniaturized gas chromatograph" is well known to convey certain structural/dimensional characteristics to those of ordinary skill in the art. Thus, it does give life, meaning, and vitality to the claim, and therefore should be given patentable weight.

Lehmann 2001 is directed to a miniaturized gas chromatograph. As discussed above, a skilled artisan would not have had a reason to combine references teaching the manufacture of conventional gas chromatographs, such as the Jones references, with those teaching miniaturized gas chromatographs, such as Lehmann 2001. In fact, the Jones references are non-analogous art with respect to not only the claimed invention, but also Lehmann 2001. Nevertheless, even assuming for the sake of argument that a skilled artisan would have combined the teachings of the Jones references and Lehmann 2001, the combination of cited references still fails to disclose or suggest certain features of the claimed invention.

The claimed miniaturized gas chromatograph comprises an electronic control and evaluation unit placed on the circuit board which also has the injector, the separation column, and the detector. The Examiner asserts that a control and evaluation unit "will have to be present on the device of Lehmann" 2001, and that this meets the claimed element of having an electronic control and evaluation unit placed on a circuit board (Office Action of June 18, 2010, page 5; Advisory Action of December 3, 2010, page 2). However, there is no basis for this assertion. A number of different solutions would be available to the skilled person to provide a control and evaluation unit with the Lehmann 2001 device. For example, it could be incorporated into a computer which may also be used to store and display results and, in that case, it would be positioned a distance from the gas chromatograph itself. Alternatively, a control and evaluation unit could be provided in a separate housing.

In any event, it is not implicit from Lehmann 2001 that a control and evaluation unit would necessarily be arranged on a circuit board which further comprises an injector, a column, and a detector. To the contrary, a skilled artisan would have been motivated to not include any heat sensitive components like a control and evaluation unit, which incorporates electronic

components, onto the same circuit board as an injector, separation column, and detector, which would typically have heating devices (because they must be heated to a high temperature to conduct the analysis). Such an arrangement would be expected to negatively affect the function of the electronic components of the control and evaluation unit. Thus, though it may be true that a control and evaluation unit may be present with the Lehmann 2001 device, an ordinary artisan would not have been motivated to arrange this unit on the same circuit board as an injector, separation column, and detector.

Instead, this is a specific embodiment with advantages recognized by the subject inventors, including that it allows for a compact and miniaturized design of the whole gas chromatograph and those electronic components required for evaluating the data and controlling the analytical process. It is possible to incorporate the control and evaluation unit on the same circuit board as the injector, separation column, and detector in the claimed invention because the subject inventors discovered that a plurality of recesses provided in the circuit board advantageously protect the electronic control and evaluation unit from the heat emitted by the heating elements. The surprising advantages of this claimed element are discussed in the subject specification (see, e.g., page 7, line 21 through page 8, line 7).

The Examiner asserts that Lehmann 2001 discloses a plurality of recesses provided in the circuit board, referring to Figure 4 of Lehmann 2001 and stating that “[t]he heater strips are placed near the trench in (the) silicon chip” (Office Action of June 18, 2010, page 6; Advisory Action of December 3, 2010, page 2). However, Figure 4 of Lehmann 2001 only shows a trench in a silicon chip and does not disclose a circuit board. Nowhere in Figure 4 or in the remainder of Lehmann 2001 or the Jones references is there disclosure of a circuit board, let alone a circuit board having a plurality of recesses as in the claimed invention. It appears that the Examiner has not differentiated between the terms “circuit board” and “silicon chip.” The Examiner states that Lehmann 2001 discloses a gas chromatography module on a silicon chip; the silicon chip is a substrate, however, this is not necessarily the same thing as a circuit board. A circuit board can be made of several materials, including laminates comprising thin copper foil as a conducting layer. Though a silicon chip could be used to produce a chromatographic column, part of an injector, and a detector, it is not necessarily a circuit board. In fact, a miniaturized chromatograph having the column and the evaluation unit on one single silicon substrate would

not function: it would not be possible to control the heat of said column in an appropriate way, and, further, such substrate of said column would have too high a conductance of heat such that any electronic component provided in such substrate would immediately fail due to high temperature. In some cases, one or more silicon chips may be used to manufacture these components and then mounted to a circuit board. In any event, the combination of cited references fails to teach or suggest any circuit board or even a specific arrangement of components made from a silicon chip placed on a circuit board. There is certainly no teaching or suggestion of a circuit board comprising an injector, a separation column, and a detector and having a plurality of recesses, as required by the claimed invention.

In the subject invention, the injector, the gas chromatographic column, and the detector are arranged in separate recesses in the circuit board and connected to the circuit board by small-dimensioned electrical wires for data transfer and small-dimensioned capillaries for gas flow. This arrangement advantageously allows the conduction of heat from these components to the electronic components of the circuit board to be significantly reduced allowing for precise temperature control of the injector, the separation column, and the detector, while also protecting the electronic components on the circuit board from heat generated in the course of the analytic process. This particular embodiment and the advantages resulting therefrom are plainly not disclosed or even contemplated in the combination of cited references.

Furthermore, the claimed invention includes a plasma-polymerized layer of plastic on the side of a sheet. The Examiner implies that that the recitation of "plasma-polymerized" is a product-by-process limitation where patentability depends on the recited product, not on its method of production. However, this assertion fails to take into account the fact that a plasma-polymerized layer by definition imparts specific characteristics of the product manufactured by the process. That is, the plasma-polymerized layer will necessarily be an extremely thin layer to a degree not possibly contemplated or suggested by the Jones references. These structural distinctions are inherent and must be accorded adequate weight. Though no specific dimensions are recited, an ordinary skilled artisan would understand that a plasma-polymerized layer in a miniaturized gas chromatograph would necessarily be extremely thin (on the micro scale) and is quite different than the macro-scale clad of Jones. Thus, the combination of cited references

fails to teach or suggest any layer having the inherent, art-recognized characteristics of the plasma-polymerized layer of the claimed invention.

As discussed above, an ordinary artisan would not have had a reason to turn to the Jones references for any teaching related to miniaturized gas chromatographs, nor would a skilled person have combined the teachings of Lehmann 2001 with those of Jones. In fact, the Jones references are non-analogous art to both the claimed invention and Lehmann 2001. Even assuming for the sake of argument that these references were combined, certain important aspects of the claimed invention are still not disclosed or suggested. For example, there is no teaching or suggestion of a control and evaluation unit on a circuit board with an injector, a separation column, and a detector, or of a plurality of recess provided on such a circuit board. When determining whether a claim is obvious, an examiner must make “a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art.” *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, “obviousness requires a suggestion of *all* limitations in a claim.” *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (citing *In re Royka*, 490 F.2d 981, 985 (CCPA 1974)) (emphasis added). Accordingly, the Examiner has not established a *prima facie* case of obviousness for claims 1, 2, 6, 9, and 11-13.

#### Claim 4

Claim 4 recites that the layer of plastic on the side of the sheet is a plasma-polymerized layer of organic monomers selected from difluoromethane, hexafluorobutadiene, or octafluorocyclobutane. The Examiner states that this claim is a product-by-process claim and that “[t]he patentability of said claim is based on the recited product and does not depend on its method of production” (Office Action of June 18, 2010, page 5; Advisory Action of December 3, 2010, page 3). However, as discussed above in subsection A, this assertion fails to take into account the fact that a plasma-polymerized layer by definition imparts specific characteristics of the product manufactured by the process. That is, the plasma-polymerized layer will necessarily be an extremely thin layer to a degree not possibly contemplated or suggested by the

combination of cited references. These structural distinctions are inherent and must be accorded adequate weight.

In addition, claim 4 specifies that the layer is a plasma-polymerized layer of organic monomers selected from difluoromethane, hexafluorobutadiene, or octafluorocyclobutane. The resulting layer will inherently comprise a polymer made up of one or more of the recited monomers. Thus, in addition to the numerous deficiencies of the combination of the Jones references and Lehmann 2001 discussed above, the combination of cited references fails to teach or suggest any layer having the inherent characteristics of the plasma-polymerized layer of claim 4. Accordingly, the Examiner has not established a *prima facie* case of obviousness for claim 4.

**B. Claim 5 is patentable because the Examiner has not established a *prima facie* case of obviousness.**

Claim 5 has been rejected under 35 U.S.C. §103 (a) as being obvious over Jones '465 or Jones '602 in view of Lehmann 2001, and further in view of Lehmann *et al.* (IDS: Micro Total Analysis system, 2000, 167-170; hereinafter referred to as "Lehmann 2000").

As discussed above in subsection A, an ordinary artisan would not have had a reason to turn to the Jones references for any teaching related to miniaturized gas chromatographs, nor would one of ordinary skill in the art have combined the teachings of Lehmann 2001 with those of Jones. In fact, the Jones references are non-analogous art to the claimed invention, Lehmann 2001, and Lehmann 2000, which pertain to miniaturized gas chromatographs.


Moreover, Lehmann 2000 fails to teach or suggest the elements missing from the combination of the Jones references and Lehmann 2001. Thus, even assuming for the sake of argument that these references were combined, certain important aspects of the claimed invention are still not disclosed or suggested. For example, there is no teaching or suggestion of a control and evaluation unit on a circuit board with an injector, a separation column, and a detector, or of a plurality of recess provided on such a circuit board. When determining whether a claim is obvious, an examiner must make "a searching comparison of the claimed invention – including all its limitations – with the teaching of the prior art." *In re Ochiai, supra*. (emphasis added). Thus, "obviousness requires a suggestion of *all* limitations in a claim." *CFMT, Inc. v.*

*Yieldup Intern. Corp., supra. (citing In re Royka, supra.)* (emphasis added). Accordingly, the Examiner has not established a *prima facie* case of obviousness for claim 5.

### C. Conclusion

In view of the foregoing, the Appellants urge the Board to reverse the outstanding rejections of claims 1, 2, 4-6, 9, and 11-13 under 35 U.S.C. §103(a) and pass this application to issuance.

Respectfully submitted,



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### VIII. CLAIMS APPENDIX

1. Miniaturized gas chromatograph comprising at least one injector (1), one separation column (2) and a detector (3) wherein the injector (1), the separation column (2) and the detector (3) are combined on a circuit board (4) to give a gas chromatography module (5), and the injector (1) comprises a first sheet (6) with channels (12) and a second sheet (7) with channels (13) wherein the sheets may be displaced relative to each other, whereby at least one of the sheets (6, 7) is provided with a layer (8) of plastic on the side of the sheet facing the other sheet (7, 6), wherein the layer (8) of plastic is a plasma polymerized layer,

further comprising at least one heating element (10) configured such that one or more of the injector (1), the separation column (2) and/or the detector (3) can be temperature-controlled, and further comprising an electronic control and evaluation unit placed on the circuit board and a plurality of recesses (15, 23, 24) provided in the circuit board (4) such that the electronic control and evaluation unit (9) is protected from the heat emitted by the heating elements (10).

2. Miniaturized gas chromatograph pursuant to claim 1, wherein the plastic is chemically inert.

Claim 3 was canceled by Amendment dated August 18, 2009.

4. Miniaturized gas chromatograph pursuant to claim 1, wherein the layer is a plasma polymerized layer of organic monomers selected from difluoromethane, hexafluorobutadiene, or octafluorocyclobutane.

5. Miniaturized gas chromatograph pursuant to claim 1, wherein the sheets (6, 7) are made of silicon.

6. Miniaturized gas chromatograph pursuant to claim 1, wherein the plastic has a lower coefficient of static friction than silicon.

Claims 7 and 8 were canceled by Amendment dated August 11, 2010.

9. Miniaturized gas chromatograph pursuant to claim 1, wherein at least one heating element (10) comprises ceramic plates with heating elements made via thick film technology.

Claim 10 was canceled by Amendment dated August 11, 2010.

11. Miniaturized gas chromatograph pursuant to claim 1, wherein the second sheet (7) is covered by a cover sheet (11).

12. Miniaturized gas chromatograph pursuant to claim 1, wherein the first sheet (6) comprises at least three channels (12), and the second sheet (7) comprises at least two supply channels (13) and two discharge channels (14).

13. Miniaturized gas chromatograph pursuant to claim 1, further comprising a plurality of recesses (16) provided in the circuit board into which a plurality of capillaries (18) are countersunk for the gas flow.

Claims 14-16 were canceled by Preliminary Amendment dated June 22, 2006.

Claim 17 was canceled by Amendment dated August 18, 2009.

Claims 18 and 19 were canceled by Amendment dated August 11, 2010.

Claim 20 was canceled by Amendment dated August 18, 2009.

Claims 21-23 were canceled by Amendment dated August 11, 2010.

Claims 24-26 were canceled by Preliminary Amendment dated June 22, 2006.

Claims 27 and 28 were canceled by Amendment dated August 11, 2010.



IX. EVIDENCE APPENDIX

Attached hereto are an Extract of IEEE Xplore regarding Sensor (2003) - Proceedings of IEEE publication, the Declaration of Uwe Lehmann, and the Declaration of Lars Birken.

The Extract of IEEE Xplore regarding Sensor (2003) was submitted with the Amendment filed August 18, 2009. The Declaration of Uwe Lehmann and the Declaration of Lars Birken were both submitted with the Amendment of May 4, 2010. The Extract of IEEE Xplore was fully considered and entered into the record by the Examiner, as indicated in paragraph 16 of the Office Action dated December 4, 2009. The Declaration of Uwe Lehmann and the Declaration of Lars Birken were both fully considered and entered into the record by the Examiner, as indicated in paragraph 12 of the Office Action dated June 18, 2010.

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# Declaration of Uwe Lehmann

I, Uwe Lehmann declare and say as follows:

1. I am citizen of Germany, resident at St. Gallerstrasse 42a / CH 7320 Sargans / Switzerland, and I am one of the inventors of a miniaturized gas chromatograph and injector for the same disclosed and claimed in my above-identified US-patent application serial number 10/541,145.
2. I am completely familiar with the content of the subject patent application, which I read and understood at the time the application was filed in the US patent office.
3. I have been observing the technical development in miniaturized gas chromatography analytic devices for more than 10 years.
4. From a technical view point, there are two different types of gas chromatographs which are currently in use. The first type of chromatograph which could be referenced to as conventional chromatograph, comprises a column which is usually made from glass in a process where the glass is formed in a molten, deformable state into an elongated tube which may be wound to have different geometries. This type of chromatograph usually relies on an injector which is made from a material using manufacturing techniques like milling, casting and which is mounted using screws, bolts, welding or soldering techniques or the like. This first type of gas chromatographs cannot be manufactured to have smaller dimensions than approximately 100 x 50 x 50 cm. The typical application of such gas chromatographs is the use in scientific laboratories and in industrial chemical production facilities.
5. The second type of gas chromatographs which is known for approximately thirty years now is the so called miniaturized gas chromatograph. This second type of gas chromatographs is entitled to be "miniaturized" to characterize that it is manufactured using techniques applied in micromachining like masking, etching of wafer substrates usually made from silicon. This second type is sometimes called a "micro-technological" gas chromatograph as well. The skilled person will acknowledge a "miniaturized" or "micro-technological" gas chromatograph with this second type of gas chromatograph only and will thus take from this wording that the gas chromatograph is manufactured using the above mentioned specific masking, etching and bonding techniques and that the gas chromatograph usually comprises an injector, a column and a detector which size is below or close to 1 x 1 x 1cm.
6. When assessing design or manufacturing techniques of a miniaturized gas chromatograph the skilled person will usually not apply design or manufacturing rules of conventional gas chromatographs of the first type explained above. The reason for this is that the manufacturing techniques of the two types of gas chromatographs explained above are completely different and thus the skilled person would not expect to be able to transfer a design or manufacturing technique from one type of gas chromatograph to the other type.

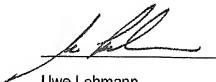
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7. I am further one of the others of the publication "A miniaturized gas chromatographic module on a credit card size mother board" published in Sensor Proceedings, 2003, pages 157-161. I prepared this publication in order to present it on the second IEEE International Conference on Sensors which took place in Toronto, Canada from October 22-24, 2003. The article "A miniaturized gas chromatographic module on a credit card size motherboard" was appointed the reference number B3.3 and was published in sensors, 2003, proceedings of IEEE. This publication was at the first time available not before starting of the tutorials of said conference on October 21, 2003.
8. Actually, I remember that I finalized the paper "A miniaturized gas chromatographic module on a credit card size motherboard" short before the deadline for online submission which ended on 1 October 2003.
9. Thus, this paper was not published before the priority date of the above referenced US patent application and actually the paper was no earlier published than 21 October 2003.
10. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and believed are believed to be true; and further that these statements were made with the knowledge that willful false statements like so made are punishable by fine or imprisonment, or both, under § 1001 of title 18 of the United States Code and that such false statements may jeopardize the validity of the application or any patent issuing thereon.

Further declarant sayeth not

22<sup>nd</sup> March 2010

Date

  
Uwe Lehmann

Declaration of Dr. Lars Birken

I, Dr. Lars Birken declare and say as follows:

1. I am citizen of Germany, resident at Vor dem Berge 14/ 22337 Hamburg / Germany.
2. I am a patent attorney representing the applicant of DE 103 01 601.5 filed on 16 January 2003 and PCT/DE 2004/000035 filed on 14 January 2004 claiming priority of DE 103 01 601.5.
3. I read and understood the application DE 103 01 601.5 and the application PCT/DE 2004/000035 as filed in the original German language wording.
4. I hereby declare that the wording of DE 103 01 601.5 and the wording of PCT is identical with regard to the description, the figures, the claims and the summary as originally filed in these applications, respectively.
5. Upon entering US national phase the US representative was instructed to prepare an English language translation based on the original German language wording filed as PCT application PCT/DE 2004/000035 as filed.
6. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and believed are believed to be true; and further that these statements were made with the knowledge that willful false statement like so made are punishable by fine or imprisonment, or both, under § 1001 of title 18 of the United States Code and that such false statements may jeopardize the validity of the application or any patent issuing thereon.

4. May 2010

Date



Dr. Lars Birken

X. RELATED PROCEEDINGS APPENDIX

None.